AMENDMENTS TO THE SPECIFICATION:

Please amend the paragraphs beginning at page 1, line 17, and continuing to page 2, line 16, as follows:

Matrix materials such as carbon materials and conductive polymers which utilize a dope-undope process of lithium ions instead of utilizing lithium metal or metal alloy thereof for a negative electrode have been developed in recent years. ~~Thereby~~Accordingly, generation of dendrite ~~(~~which occurs in the case where lithium metal or metal alloy thereof is utilized~~)~~ ~~does~~ no longer theoretically occur~~s and, t~~. ~~T~~herefore, ~~considerable reduction of problems related to~~ short ~~circuiting~~ circuit problems inside of the battery has been ~~achieved~~considerably reduced. In particular, it is known that the dope-undope potential of lithium of carbon materials is closer to the deposition-dissolution potential of lithium than that of other materials. Specifically, graphite materials are carbon materials that can theoretically hold lithium in their crystal lattice at a rate of one lithium atom relative to six carbon atoms and which have a high capacity per unit weight and per unit volume. Furthermore, the potential of intercalation-deintercalation of lithium is flat in graphite materials which are chemically stable so as to greatly contribute to the cycle stability of batteries.

As a result of such research and development, a so-called lithium ion battery employing a carbon material as the negative electrode has been commercialized and has rapidly come into wide use as a power source~~s~~ for mobile devices~~, wherein the characteristics thereof such as~~

~~being~~ Such battery is lightweight and ~~having~~ has a high capacity ~~are~~ which is utilized to the fullest.

In addition, ion conductive polymers having high ion conductivities have been recently reported ~~and a variety of r~~. Research ~~have progressed in order~~has been directed to increase the prevention of liquid leakage, the safety level, and the extended shelf life of batteries in the case where liquid electrolytes are used.

Please amend the paragraphs beginning at page 3, line 4, and continuing to page 4, line 4, as follows:

Therefore, a method for achieving an increase in the ion conductivities of these ion conductive polymers has been proposed. According to the proposed method, ~~such that~~ a monomer and an organic solvent (in particular, organic solvent having a high dielectric constant such as ethylene carbonate (EC) and propylene carbonate (PC)) are mixed so as to be polymerized and, thereby, a gel polymer electrolyte (hereinafter, referred to as "chemical crosslinked gel") is obtained which maintain an electrolytic solution in a polymer network and which maintains a solid condition. The chemical crosslinked gel can greatly reduce the risk of liquid leakage~~, t~~. Therefore, it has become possible to utilize a laminate film wherein a metal foil and a resin film are stacked as an exterior material of batteries.

Manufacturing methods for such batteries are generally categorized into "stacked types" of manufacturing batteries (by stacking groups of

electrodes) and "jelly-roll (winding) types" of manufacturing batteries (by winding positive electrodes, negative electrodes and separators in band forms).

So far, the mainstream of lithium ion batteries is the "jelly-roll types" of manufacturing batteries ~~by winding~~wherein positive electrodes, negative electrodes and separators are wound in band forms in order to emphasis importance on the productivity because the forms of batteries are restricted by the battery cans. On the other hand, it is easy to process the forms of lithium polymer batteries wherein laminate films are used as exterior materials~~;~~ t. Therefore, manufacturing methods can freely be selected in order to achieve further reduction in weight and further freedom in the forms in addition to reductions in weight and increases in the capacity of lithium ion batteries and, for example, a stacked type can be adopted so that thin batteries having large areas can easily be manufactured.

Please amend the paragraphs beginning at page 4, line 14, and continuing to page 5, line 8, as follows:

On the other hand, stacked type batteries in general have high freedom in ~~forms~~ form and have characteristics ~~that they are~~ suitable for thin batteries, while mechanization of production is difficult due to the complication of their stacking processes. Although regulation of the sizes of positive electrodes, negative electrodes, and separator layers for separating between the positive electrodes and the negative electrodes has been proposed in order to increase the reliability (see, for example,

Japanese Unexamined Patent Publication No. 2000-30742), the separator layers are set at sizes sufficiently larger than the positive electrodes and the negative electrodes in order to prevent short circuiting of the respective electrodes; t. Therefore, the problem of the complication of the stacking process is not solved. In addition, although there is an idea that separators are made to have a uniformed size and both the positive and negative electrodes are covered with the separators so that the positioning can be easily carried out, a problem arises wherein the thickness of the battery increases and the energy density is reduced when the two electrodes are covered with the separators.

Furthermore, thin batteries having broad areas have problems that the batteries are swollenswell when gas is generated from the inside and that the batteries are weak against vibration in comparison with jelly-roll type batteries due to independence of electrodes.

Please amend the caption on page 5, line 10, as follows:

BRIEF SUMMARY OF THE INVENTION

Please amend the paragraphs beginning at page 5, line 11, and continuing to page 6, line 6, as follows:

~~The present invention is provided in view of the above described problems and an object of the present invention is to provide a~~A thin type polymer battery ~~which is a thin type that is~~ intrinsic to a stacked type structure and ~~that~~ has a high freedom of forms so as to be converted to a variety of forms and ~~wherein~~ has high ~~level of~~ safety ~~is high~~, productivity ~~is high~~ and reliability ~~is high~~.

~~Thus, according to the present invention, provided is a~~A polymer battery ~~having~~ has at least one layer of a positive electrode, at least one layer of a polymer electrolyte retained by a separator, and at least one layer of a negative electrode, each of which is in a thin film form, stacked in this order~~, wherein t~~. The entirety of the outer peripheries of the separator and of the negative electrode is positioned outside of the outer periphery of the positive electrode except for a collector tab ~~(4)~~ provided to the positive electrode so as to protrude from one side of the positive electrode~~, and t~~. The following relationship is satisfied in a portion of the outer peripheries of the separator and of the negative electrode: the length between the end of the negative electrode and the end of the positive electrode (D1) > the length between the end of the negative electrode and the end of the separator (D2).

Furthermore, ~~according to the present invention, provided is~~ a manufacturing method is provided for the above polymer battery, stacked

in this order~~,~~ ~~t~~. The manufacturing method ~~comprising~~ comprises the steps of:

Please amend the paragraphs beginning at page 6, line 24, and continuing to page 7, line 5, as follows:

Fig. 1 is a schematic plan view of a main portion for describing the positional relationship between a positive electrode, a polymer electrolyte retained by a separator and a negative electrode of a polymer battery according to ~~the present invention~~an example embodiment; and

Fig. 2 is a schematic plan view of a main portion for describing the step of stacking the positive electrode, the polymer electrolyte retained by the separator and the negative electrode at the time of manufacturing a polymer battery according to ~~the present invention~~an example embodiment.

Please amend the caption on page 7, line 7, as follows:

DETAILED DESCRIPTION ~~OF THE PREFERRED EMBODIMENT~~

Please amend the paragraphs beginning at page 7, line 8, and continuing to page 7, line 15, as follows:

A polymer battery according to the ~~present invention~~an example embodiment has a configuration in that a positive electrode, a polymer

electrolyte retained by a separator, and a negative electrode, each of which is in a thin film form, are stacked in this order.

It is preferable for the polymer battery according to the present ~~invention~~ embodiment to be conventionally referred to as a lithium polymer battery~~;~~ ~~h~~. However, it may not be limited to a lithium polymer battery but rather may be another type of a polymer battery.

Please amend the paragraphs beginning at page 19, line 16, and continuing to page 21, line 4, as follows:

It is preferable for the polymer electrolyte to have high viscosity in the polymer battery ~~of the present invention~~. Herein, having high viscosity indicates the exhibition of the viscosity in the case where the surface of the polymer electrolyte is pressed against another surface such that the electrodes have adhesiveness that can retain their own weight in the condition that the positive electrode, the polymer electrolyte and the negative electrode are stacked and it is preferable for the polymer electrolyte to have viscosity higher than such viscosity. Therefore, the viscosity can be appropriately adjusted according to the sizes, weights, and the like of the stacked electrodes. Thus, risk of short circuiting due to a shift of the electrodes during the process after stacking and due to vibrations at the time of utilization of the battery are reduced by using a polymer electrolyte having high viscosity and, thereby, the reliability of the battery can be increased and the size of the separator can be limited to the minimum requirements.

Furthermore, it is preferable to remove factors for lowering the adhesiveness at the time when the stacked electrodes are secured to each other by means of the viscosity of the polymer electrolyte in order to increase vibration-proof properties of the completed battery in the polymer battery ~~of the present invention~~. As for such factors, vaporization of a solvent of a low boiling point in the case where the battery exposed to a high temperature, gas generation due to the decomposition of the electrolytic solution resulting from the repetitive utilization (charge and discharge) of the battery, application of stress to the stacked electrodes in the peeling direction due to a gas and the like can be cited. Accordingly, it is effective to adopt a component of the electrolytic solution that does not include the solvent of a low boiling point and to suppress the generation of gas resulting from a side reaction with the electrodes. It is necessary to adopt a positive electrode material, a negative electrode material, a polymer electrolyte and the like which do not easily generate a gas and to select a combination of these materials which do not easily generate a gas from the point of view of a restriction of generation of a gas. This is because, in the case where a gas is locally generated, the interfaces between the polymer electrolytes and the electrodes in this portion is broken down so that a force for peeling the laminate which has been secured by means of the viscosity of the polymer electrolyte is made to be in effect.

The polymer battery of the present ~~invention~~ embodiment is formed by stacking at least one layer of a positive electrode, a polymer electrolyte retained by one layer of a separator and one layer of a negative electrode.

Please amend the paragraph beginning at page 22, line 23, and continuing to page 23, line 6, as follows:

The positive electrode, the separator and the negative electrode are first processed so that the outer periphery of the separator and the negative electrode is positioned outside of the outer periphery of the positive electrode at the time when the positive electrode, the separator and the negative electrode are stacked according to a manufacturing method for a polymer battery of the present ~~invention~~technology. Such processes can be carried out according to a method well known in the art. Herein, after the above described processes, the separator and the polymer electrolyte, preferably the separator, the positive electrode and the polymer electrolyte are polymerized/crosslinked so as to be integrated.

Please amend the paragraph beginning at page 23, line 17 and continuing to page 23, line 18, as follows:

In the following, a polymer battery and a manufacturing method for the same ~~according to the present invention~~ will be described in detail.

Please amend the paragraph beginning at page 25, line 5, and continuing to page 25, line 16, as follows:

A mixed solvent of 1 : 1 of ethylene carbonate (EC) and γ-butyrolactone in which 1.8 mol/l of $LiBF_4$ is dissolved was used as the electrolytic solution. A tetrafunctional acrylate monomer having an average molecular weight of 7500 to 9000 that contains a copolymer of polyethylene oxide and polypropylene oxide that becomes a precursor of a polymer electrolyte was mixed with monofunctional acrylate monomer having an average molecular weight of 200 to 300 according to the weight ratio of 7 : 3. The electrolytic solution and the monomer are mixed with each other according to the ratio of 97 : 3. ~~200~~ Two hundred ppm, relative to the total weight, of a thermal polymerization initiating agent is added to the obtained solution so as to prepare a precursor solution.

Please amend the paragraph beginning at page 27, line 12 and continuing to page 27, line 18, as follows:

The obtained electrode (positive electrode) was carefully stacked on the negative electrode so as to be placed within the area of the negative electrode and this operation was repeated so that a lithium polymer battery having 10 layers of positive electrodes and 11 layers of negative electrodes was prepared. ~~20~~ Twenty polymer batteries ware manufactured in the same manner and were evaluated in the same manner as in Example 1. The result thereof is shown in Table 1.

Please amend the paragraph beginning at page 28, line 1, and continuing to page 28, line 8, as follows:

A separator integrated to the obtained positive electrode and a separator integrated to the negative electrode were stacked so that the opposing sides thereof coincided with each other and this operation was repeated so as to obtain a lithium polymer battery having 10 layers of positive electrodes and 11 layers of negative electrodes. ~~20~~ Twenty polymer batteries were manufactured in the same manner as described above and were evaluated in the same manner as in Example 1. The result thereof is shown in Table 1.

Please amend the paragraphs beginning at page 31 line 16, and continuing to page 32, line 1, as follows:

A stacked type battery was manufactured using an electrode laminate 6 wherein the size of the positive electrode is 62 mm × 30 mm, the size of the separators integrated to the both sides of the positive electrode is 64 mm × 32 mm and the size of the negative electrode is 64 mm × 32 mm as well as using, for positioning, a stacking device having a simple stacking stage 5 with protrusions 7 perpendicular to each other as shown in Fig. 2.

Usage of this device made it possible to easily position electrode laminate 6 integrated to the electrodes and to the separators with high precision through a simple operation of pressing electrode laminate 6

against protrusions ~~9~~ 7 for positioning in the longitudinal and lateral directions.

Please amend the paragraph beginning at page 32, line 10, and continuing to page 32, line 15, as follows:

According to the present ~~invention~~technology, it becomes possible to laminate positive electrodes and negative electrodes in precise positions in the case where a laminate is formed. In addition, the shifts of the electrodes can be limited to the minimum after stacking and it becomes possible to increase the reliability against vibrations at the time utilization of the battery.

Please amend the paragraphs beginning at page 32, line 26, and continuing to page 33, line 19, as follows:

Furthermore, according to the present ~~invention~~technology, a positive electrode, a polymer electrolyte and a negative electrode can be stacked without fail ~~irrelevant~~ regardless of the sizes of electrodes and, in addition, stacking of the electrodes and the like becomes possible without changing the manufacturing units according to a simple method such as mechanization even when the sizes of the electrodes and the like are changed. Accordingly, it becomes possible to sufficiently utilize the characteristics inherent to polymer batteries such that the freedom of the forms is high being applicable to a variety of forms.

In addition, shifts of the electrodes can be suppressed after stacking by adopting a way of stacking of electrodes such that a positive electrode and a separator are stacked on a negative electrode after a positive electrode and a separator are integrated; a usage of a gel having a high viscosity; and usage of materials and a combination of materials from which gases are hardly generated, ~~and, thereby~~Accordingly, shifts of electrodes due to vibrations at the time of utilization of the battery can be prevented, so that short circuiting between a positive electrode and a negative electrode can be prevented and it becomes possible to further increase the reliability.